RE-150 SERVICE NOTES

First Edition

Second Printing (July 12, 1983 E2)

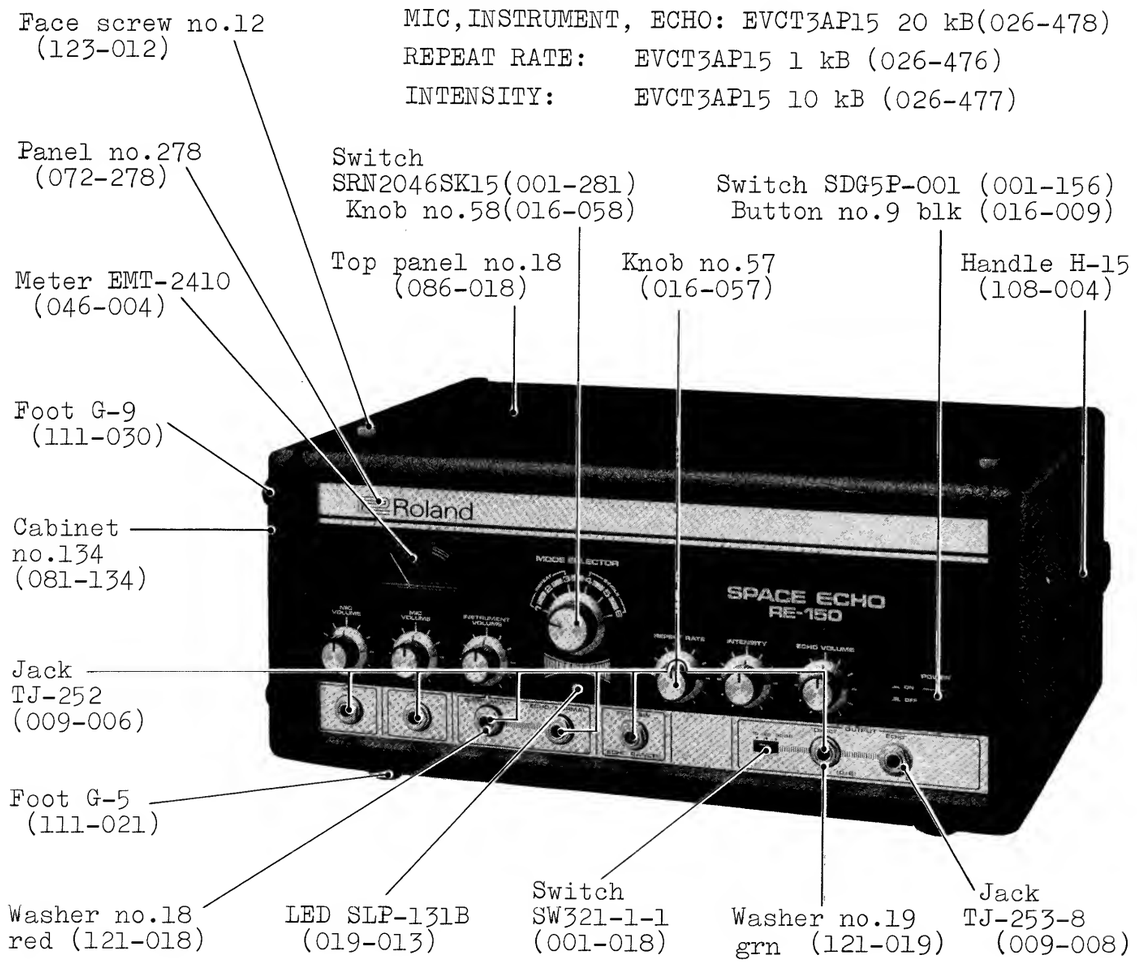
Input Sensitivity for Specific Output	MIC: 3.16 mv rms (-50 dB) INSTRUMENT: 17.8 mv rms (-35 dB)
Input Impedance	MIC: 5 k-ohm; INSTRUMENT: 470 k-ohm
Output Level	H: 178 mv rms (-15 dB); M: 56.2 mv rms (-25 dB) L: 17.8 mv rms (-35 dB)
Output Impedance	Less than 2 k-ohm
Signal/Noise Ratio	Better than 60 dB
Echo Delay Time	60 ms-600 ms
Power Consumption	16 watts
Dimensions	415 (w) x 186 (h) x 310 (d) mm
Weight	8.2 kg

Potentiometers

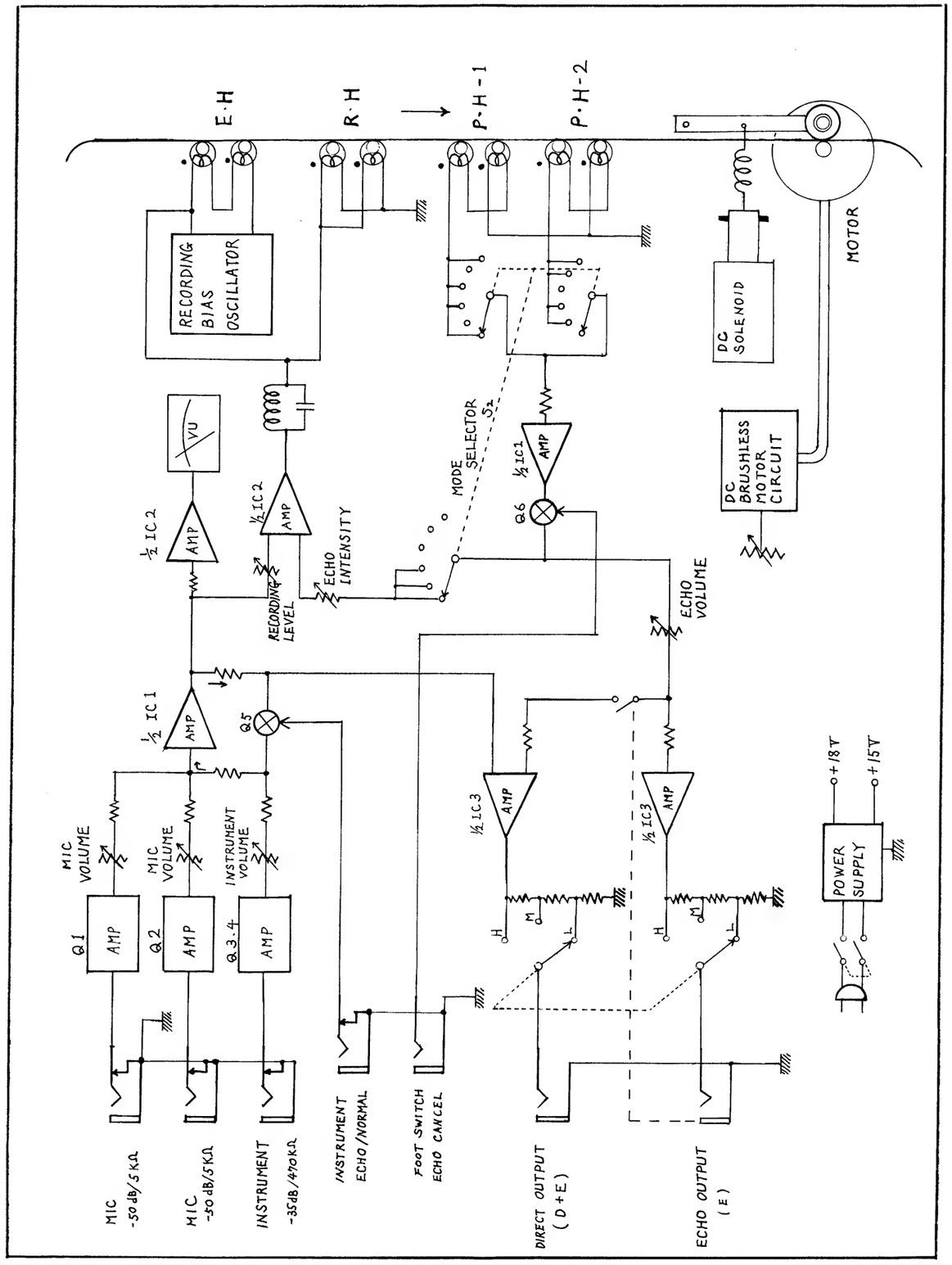
MIC, INSTRUMENT, ECHO: EVCT3AP15 20 kB(026-478)

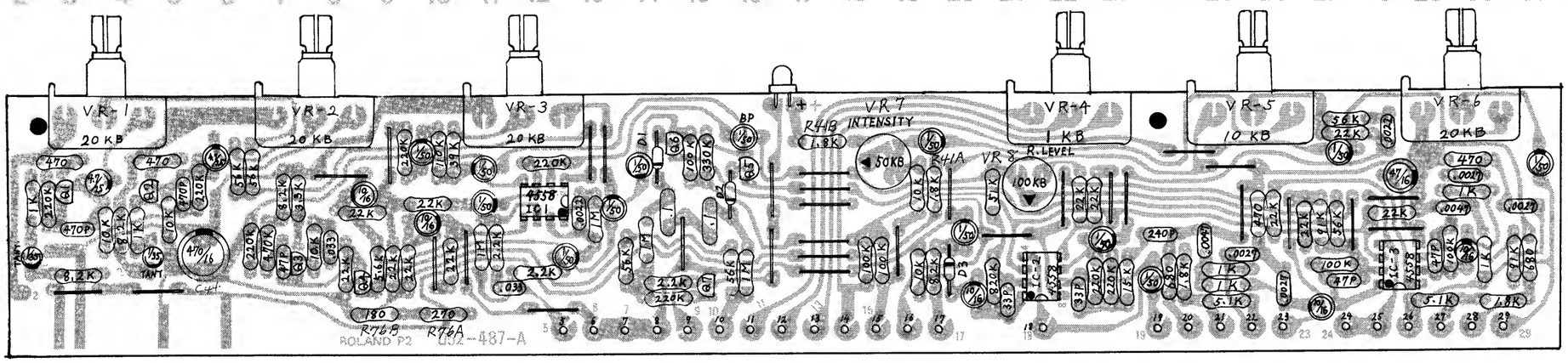
REPEAT RATE: EVCT3AP15 1 kB (026-476)

INTENSITY: EVCT3AP15 10 kB (026-477)



RE-150 BLOCK DIAGRAM

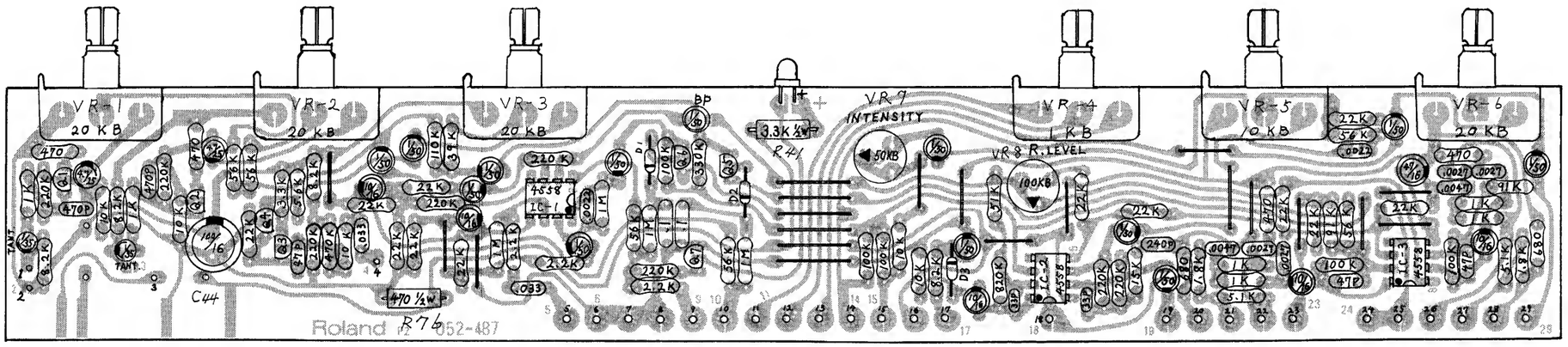




Above **OP-141A** (149-141A) (pcb 052-487A)

View from foil side

OP-141 (149-141) (pcb 052-487) Below



OP-141

Q1,2: 2SC2240-GR
Q3 : 2SK117-GR
Q4 : 2SC732TM-GR or 2SC1000-GR
Q5,6: 2SK30ATM-GR
Q7 : 2SC945-P or 2SC1815-GR
or 2SC536KNP-F
or 2SC828-R
D1-3: 1S2473 or 1S1588

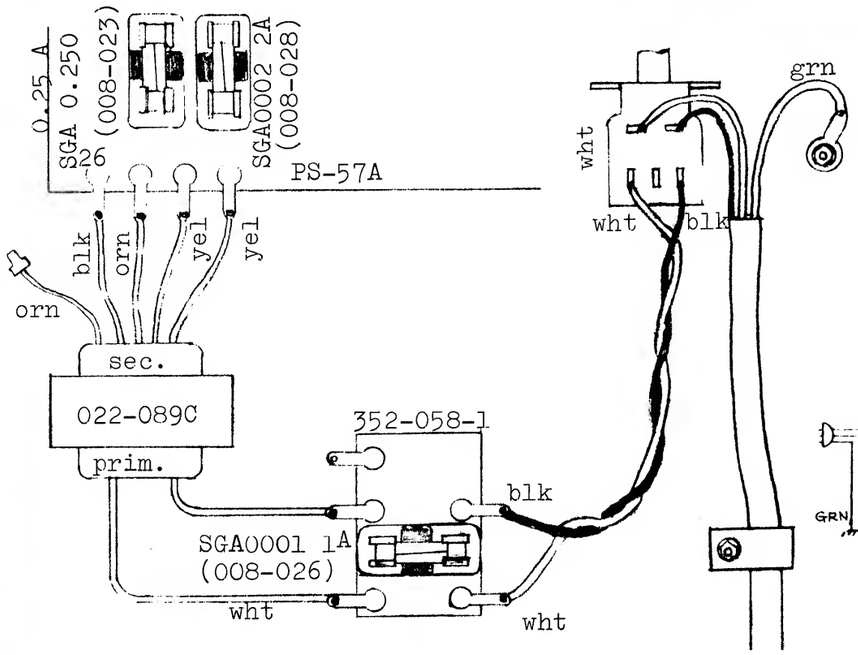
Differences between two OP-141's

This change is done for automatic pc board assembly and has no effects on circuit configuration -- minor parts value and size changes, and pattern shift --- compatible.

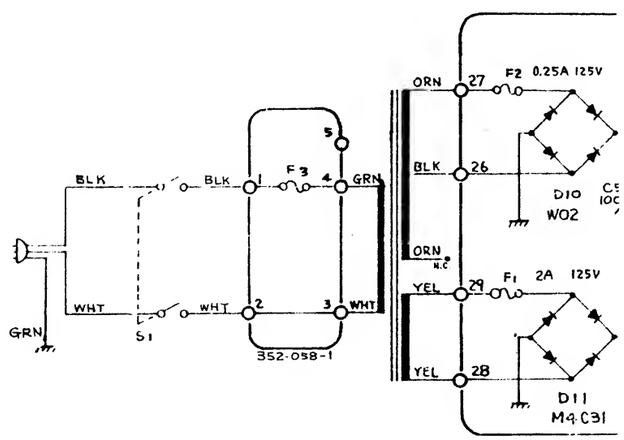
	OP-141	OP-141A
R41	470 $\frac{1}{2}$w	270 + 180 $\frac{1}{4}$w
R76	3.3 k $\frac{1}{2}$w	1.8 k + 1.8 k $\frac{1}{4}$w
C44	100/16 v	470/16 v

PS-57

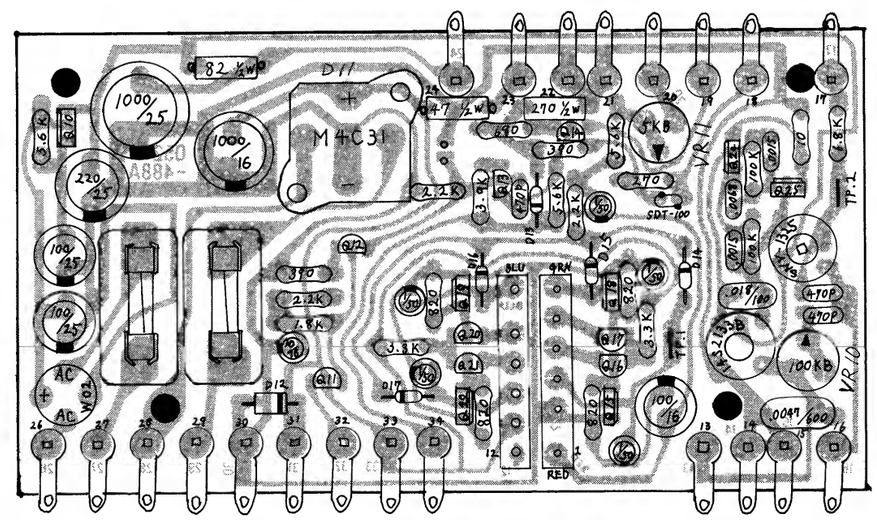
Q10,15,18,19,22,24,25:2SD571-L
Q11, 12, 14 : 2SC945-P
Q13, 16, 17, 20, 21: 2SA733-P
D12 : 10E2, 1N4003 or 1SR35
D13 : RD5.6EB or 05Z5.6L
D14-17: 1S2473 or 1S1588

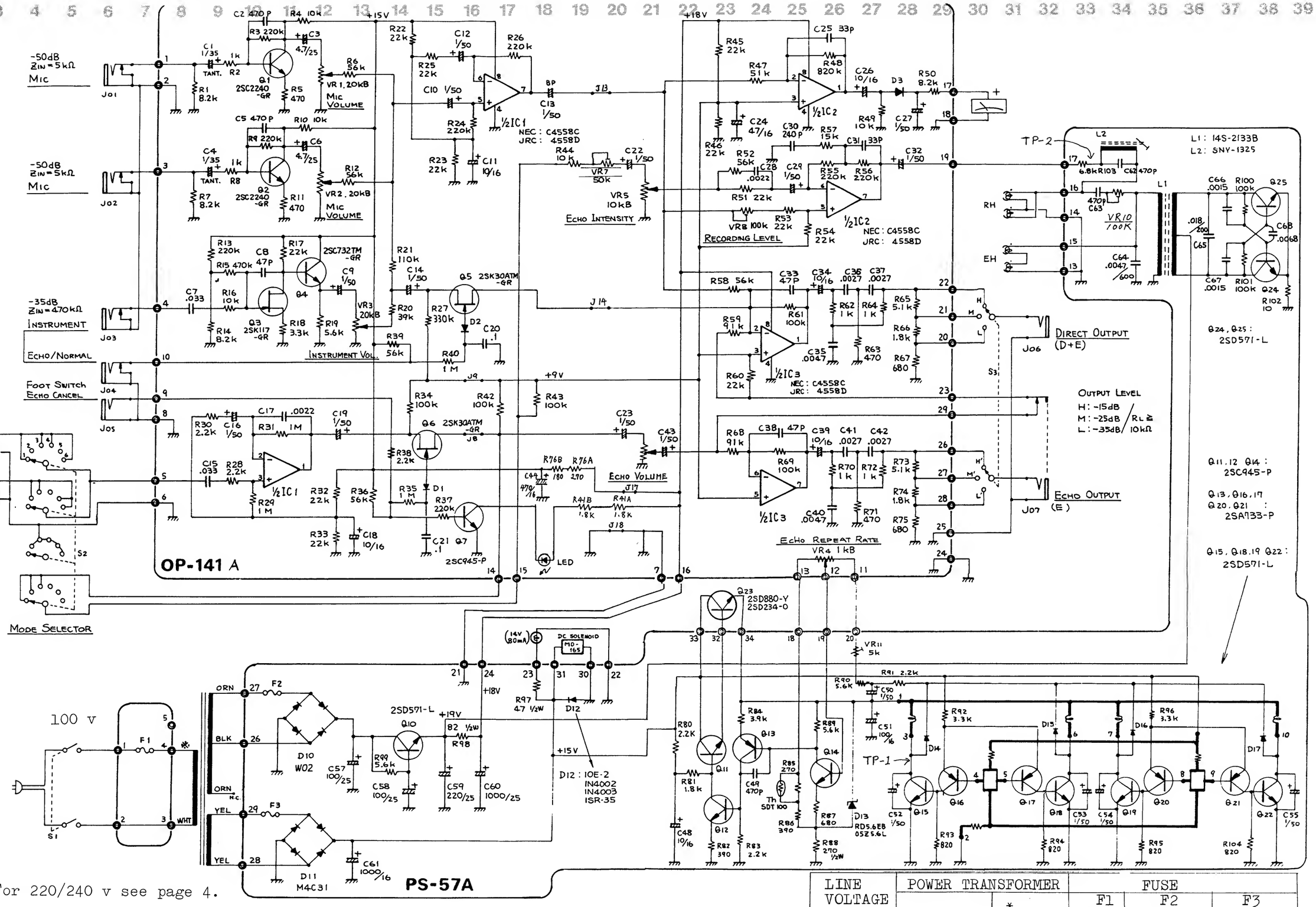


AC CONNECTION
117 V



PS-57A (146-057A) (pcb 052-488A)



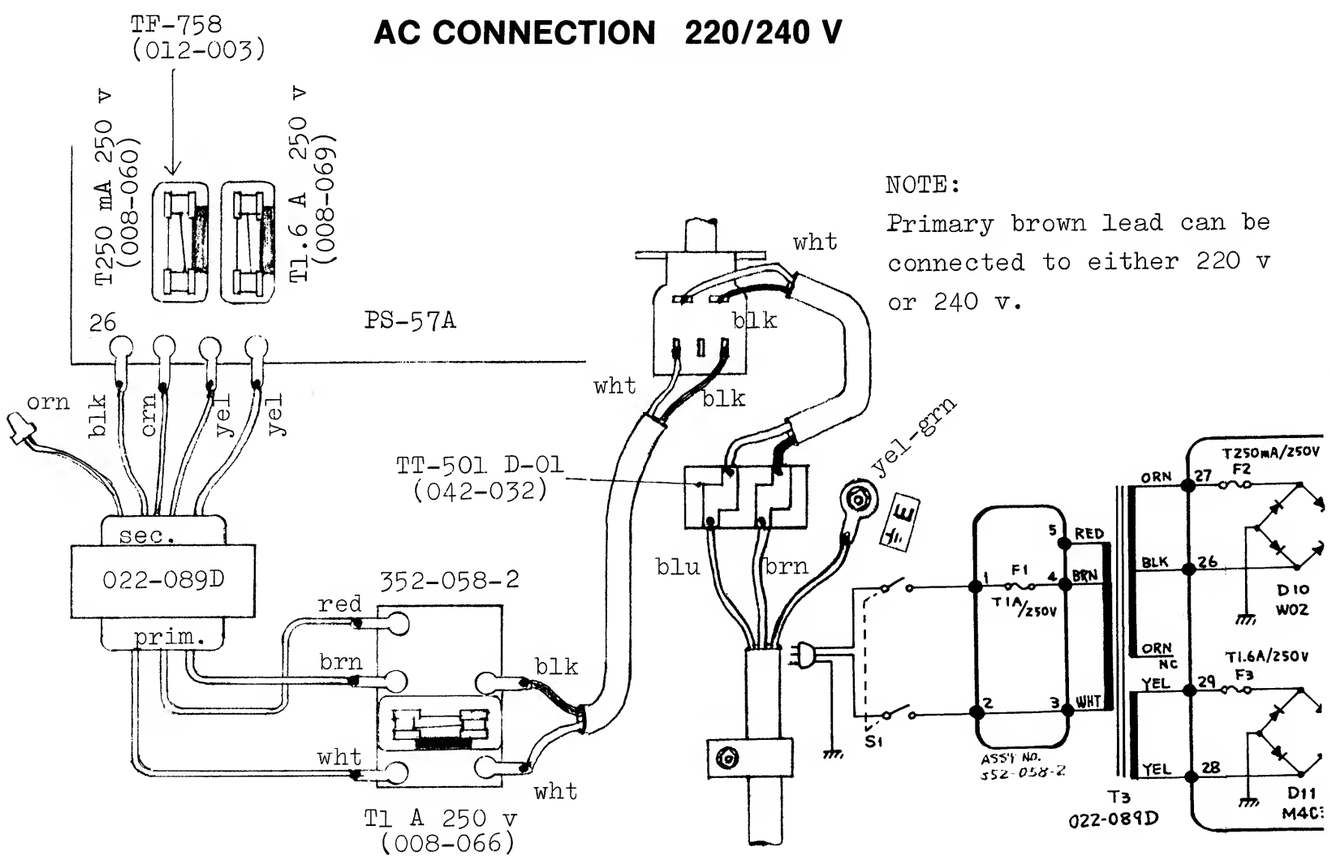


For 220/240 v see page 4.

LINE VOLTAGE	POWER TRANSFORMER	*	FUSE F1	FUSE F2	FUSE F3
100	022-089N	blue	1 A	250 mA	2 A
117	022-089C	green	1 A	250 mA	2 A
220/240	022-089D	brown	T1 A	T250 mA	T1.6 A

NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
01	120-036	Face nut no.36	18	070-018	Spring no.18
03	092-006	Top cover (acrylic)	19	...	Collar (plastic) 3 x 6 mm
04	079-004	Frame no.4	20	120-001	Sleeve nut no.1 3 x 10 mm
06	079-012	Frame no.12	21	...	Screw 3 x 12 mm B.H.
07	079-013	Frame no.13	23	...	Screw 3 x 6 mm w/washer(SEMS)
08	079-014	Frame no.14	24	...	Screw 3 x 15 mm oval c.sunk
09	079-015	Frame no.15	25	...	Screw 3 x 6 mm binding
10	079-016	Frame no.16	26	...	Screw 2.6 x 4 mm truss
11	070-033	Leaf spring no.33	28	...	Plain washer 3 x 8 x 0.3 mm
12	101-017	Felt no.17	29	...	Spring washer 3 mm dia.
13	061-063A	Tape chassis no.63A	30	...	Nut 3 mm dia.
14	065-113	Roller cover no.113	32	...	Screw 3 x 18 mm binding
15	113-004	Bearing no.4	34	101-026	Felt no.26
16	063-028	Plate no.28	36	107-003	Cushion no.3
17	070-017	Spring no.17	37	...	Screw 3 x 15 mm blk

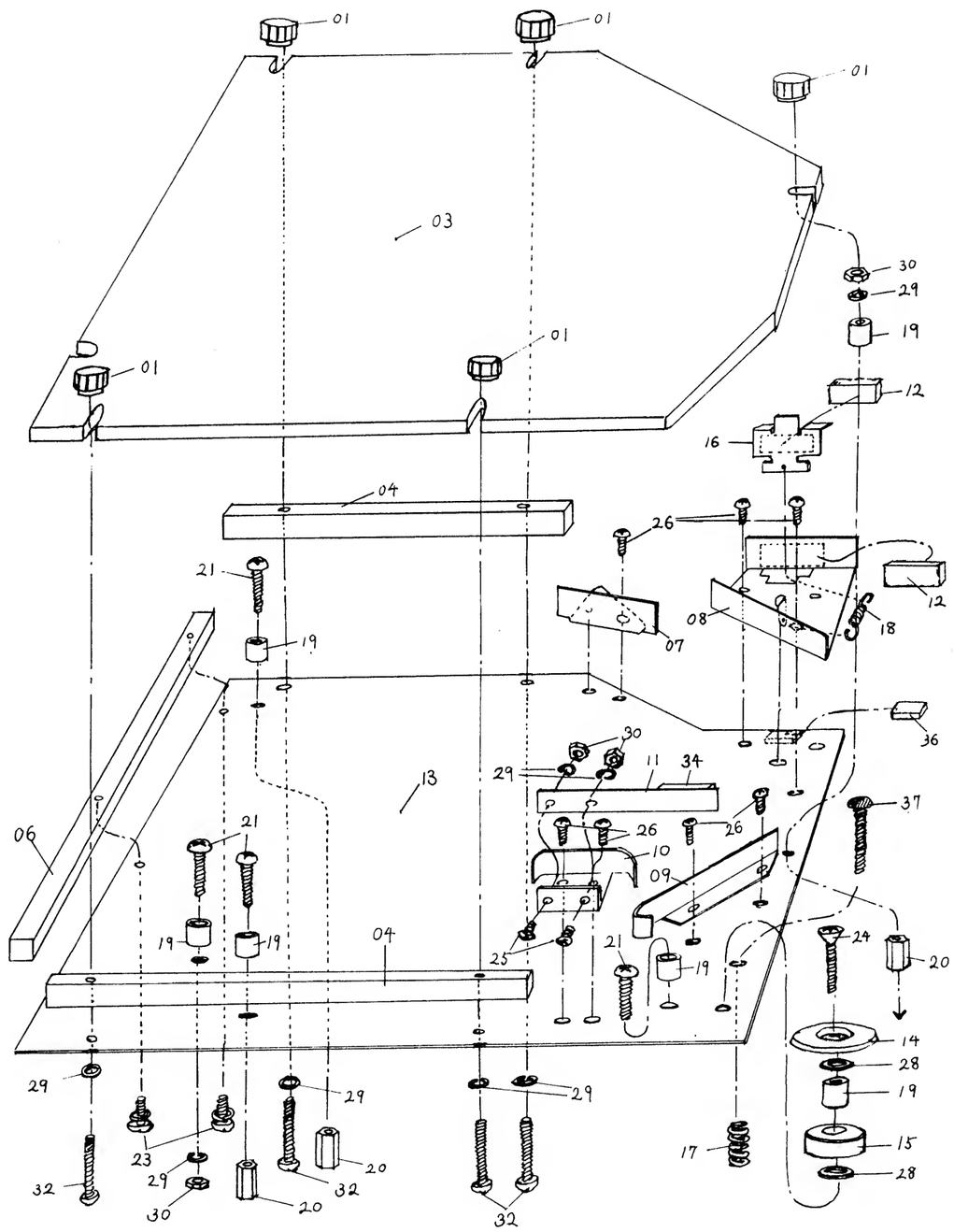
AC CONNECTION 220/240 V



NOTE:
Primary brown lead can be connected to either 220 v or 240 v.

TAPE PACK

Build Up Parts List **Exploded Illustration**



ADJUSTMENT AND CHECKING

1. MECHANICAL ADJUSTMENT

1-1. Tape Chassis Position (Fig. 1)

a) Position tape chassis 1 mm off motor shaft.
b) Secure it by tightening two screws at the rear portion.

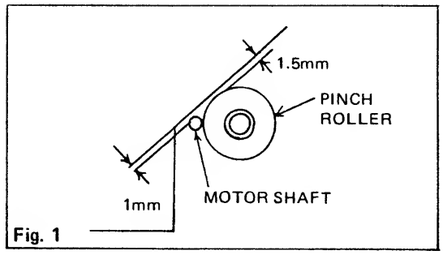


Fig. 1

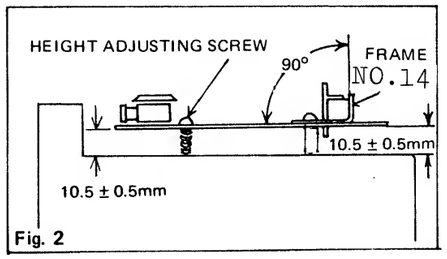


Fig. 2

1-2. Tape Chassis Height (Fig. 2)

a) Position chassis 10.5 ±0.5 mm above main chassis.
b) Check frame no.14 for deformation.

1-3. Leaf Spring Pressure (Fig. 3)

Position frame no.16 to have spring contact with bearing at 25-30 g.

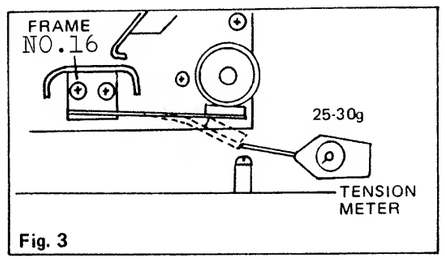


Fig. 3

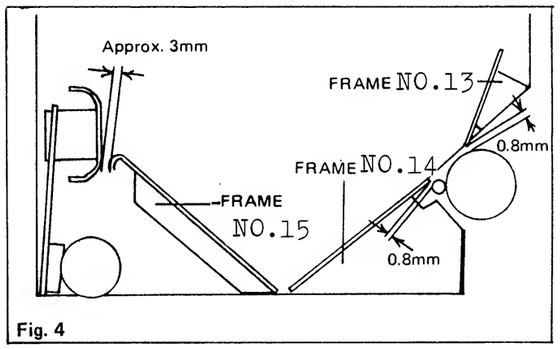


Fig. 4

1-4. Frame 13, 14 and 15 positions

While pinch roller being kept in contact with motor shaft, position and fix the frames as shown in figure 4.

1-5. Pinch Roller Pressue (Fig. 5)

With power supplied, position solenoid for 0.7k-1.1 kg pinch roller pressure.

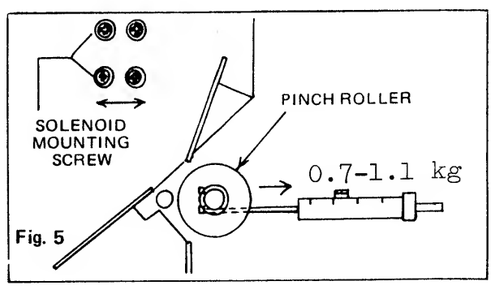


Fig. 5

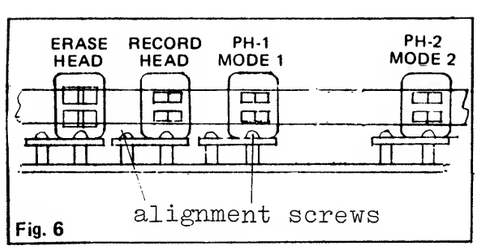


Fig. 6

1-6. Heads Alignment (Fig. 6)

a) Load tape and run it.
b) Position head gaps perpendicular to the passing tape by adjusting alignment screws.
c) Also align all heads gaps' height at wich the heads are centered on the tape.

2. ELECTRICAL ADJUSTMENT

2-1. Motor Speed

Connect oscilloscope across TP-1 and terminal no.22 (G) on power supply board PS-57.

a) Turn REPEAT RATE fcw (full clockwise).
b) Check that one cycle of waveform is approx. 20 ms (fig. 1-1).
c) Back off REPEAT RATE fccw (full counter clockwise).
d) Adjust VR-11 for 70 ms/cycle on the screen (fig. 1-2).

Delay Time ----- 600 ms: @ T = 70 ms 500 ms: @ T = 60 ms

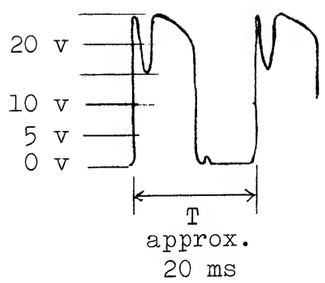


Fig. 1-1

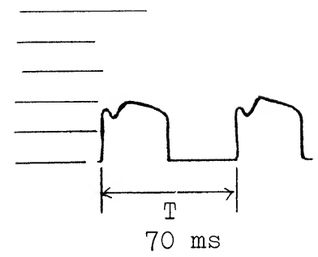


Fig. 1-2

2-2. Bias Oscillator

(1) Trap Coil

Connect millivoltmeter across TP-2 and terminal no.22. Shift scope lead to TP-2.

a) Turn MIC, INSTRUMENT and INTENSITY knobs fccw.
b) Adjust trap coil L-2 for minimum reading.
The reading must be less than 0.7 mv rms(fig.2-1).

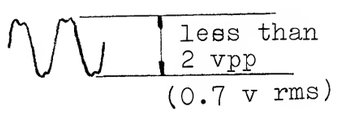


Fig. 2-1

(2) Frequency

Check that frequency is approximately 60 kHz (16.7 µs). (Fig. 2-2.)

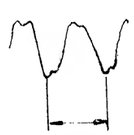


Fig. 2-2

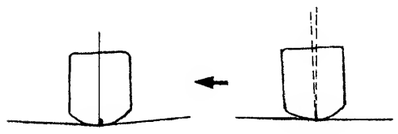
CAUTION: The following adjustments must be done only after completion of Mechanical Adjustment described on page 5.

2-3. Head Alignment

(1) Fine Alignment

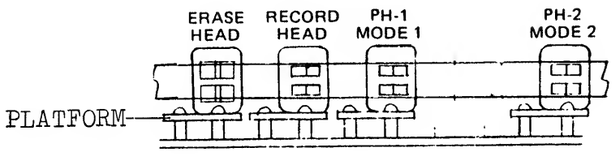
Check all heads for misalignment referring to the figures below. Readjust alignment screws at each platform as necessary.

(a) TANGENCY



The faces of the head cores must be simultaneously tangent to the same degree with the tape.

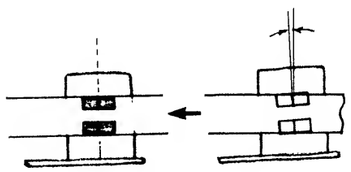
(b) HEIGHT



Every gap-width dimension is centered on the same track location.

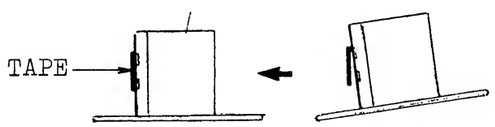
Fig. 2-3

(c) AZIMUTH



Width dimension of the head gap is a precise 90-degree angle to the tape edge.

(d) TILT



Tape head must be simultaneously tangent to the same degree with both edges of the tape.

(2) Playback Head

Setup:
Signal: 1 kHz, square wave, -50 dBv into MIC jack (MIC VOLUME: fcw)
REPEAT RATE: its midpoint (6th position) INTENSITY: fccw
ECHO VOLUME: fcw OUTPUT: -15 dB
10 k ohm resistor: into OUTPUT E jack with its leads connected to scope.

a) With MODE set to corresponding number, adjust playback head for the following:

(1) waveform slop is straightened;
(2) leading edge is as perpendicular to base line as possible or has shortest rise time. (Fig. 2-4.)

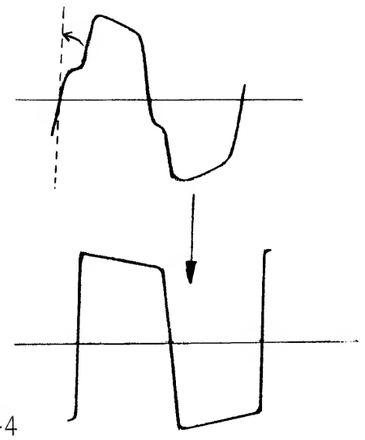


Fig. 2-4

b) If there is a level difference between playback heads, decrease higher output by slightly moving it up/down to cause the head gaps miss the tracks. Two outputs should be equal in level (fig. 2-5).

Be careful not to cause losses at high frequency. Keep head movement parallel to the orginal position.

high gain head

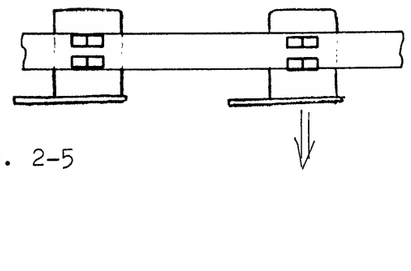


Fig. 2-5

2-4. Recording Bias

Set audio generator for sine, 1 kHz, -50 dBv.
a) Adjust VR-10 on PS-57 for maximum playback-head output.

2-5. Recording Level

Setup:
Input signal : 1 kHz, sine, -50 dBv (3.2 mv rms) into MIC jack
MIC VOLUM : fcw REPEAT RATE : its midpoint (6th point)
INTENSITY : fccw OUTPUT switch : -15 dB
Millivoltmeter : into ECHO D+E jack
ECHO VOLUME : its ninth position (nine points from full counterclockwise)
a) Adjust VR-8 on OP-141 for 178 mv reading.
b) Check that reading becomes -14 dB (200 mv) when ECHO VOLUME is fcw.

2-6. Level Meter

Check that level meter indicates 0 dB in either following A or B setting.

(A) Audio signal: 1 kHz, sine, -50 dBv (3.16 mv rms) into MIC
MIC VOLUME: full clockwise

(B) Audio signal: 1 kHz, sine, -35 dBv (17.8 mv rms) into INSTRUMENT
INSTRUMENT VOLUME: full clockwise

2-7. ECHO INTENSITY

Connect an amplifier and speaker into D+E jack.

a) With no input signal applied, set INTENSITY knob pointer to midway between 8th and 9th points on panel dial. (i.e. half past two).

b) Adjust VR-7 on OP-141 to allow echo circuits begin to oscillate.

2-8. ECHO/NORMAL Switching

Connect:

Audio signal: into INSTRUMENT Amplifier: into D+E

Foot switch: into ECHO/NORMAL

a) Step on the foot switch. Check the following:

(1) no echoes except for previously recorded;

(2) level meter reads down scale and rests at -15;

(3) when another signal is fed through MIC, it will echo.

2-9. ECHO CANCEL Switching

Withdraw foot switch from ECHO/NORMAL and plug it into ECHO CANCEL jack.

a) Step on the foot. Check the following:

(1) echo ON indicator goes off;

(2) all echoes are canceled -- unlike in ECHO/NORMAL -- even previously recorded.

PARTS LIST

CABINET

081-134	Cabinet no.134	lower
086-018	Top panel no.18	
108-004	Handle H-15	
111-021	Rubber foot G-5	large
111-030	Rubber foot G-9	small
115-002	Hinge no.2	
123-012	Face screw no.12	
073-036	Spacer no.36, scrw no.12 mount (panel no.18-chassis no.250)	
061-250	Chassis no.250	
072-278	Panel no.278	
016-057	Knob no.57 26 mm dia.	
016-058	Knob no.58 32 mm dia.	
016-009	Button no.9 power switch	
009-006	Jack TJ-252	
009-008	Jack TJ-253-8	w/switch
121-019	Washer no.19	green
121-018	Washer no.18	red

SWITCH

001-156	SDG5P-001	power
001-281	SRN2046S K15	rotary
001-018	SW-321-1-1	slide

TRANSFORMER. COIL. HEAD

022-089N	P.T. no.89N	100 v
022-089C	P.T. no.89C	117 v
022-089D	P.T. no.89D	220/240 v
022-094	Osc coil 14S-2133B	
022-045	Trap coil SNY-1325	
050-011	Solenoid MD-165	
050-010	Motor PHM-503E-M01	
049-001	Erase head AE-28	
049-003	Record head R-280-MR	
049-004	Playback head R-280-MP can be replaced by 280-MR	

PCB ASSY

149-141A	OP-141A (pcb 052-487A)	
146-057A	PS-57A (pcb 052-488A)	
	Fuse mount (pcb 052-500)	
352-058-01		117 v
352-058-02		220/240 v

FUSE. FUSEHOLDER

008-023	SGA 0.250 250 mA	100/117 v
008-026	SGA 0001 1 A prim.	100/117 v
008-060	CEE T250 mA	220/240 v
008-066	CEE T1 A prim.	220/240 v
008-069	CEE T1.6 A	220/240 v
012-003	TF-758 clip	

TRANSISTOR

017-139	2SD880-Y	
017-104	2SC732TM-GR	
017-123	2SC2240-GR	
017-023	2SC945-P	
017-072	2SD571-L	
017-024	2SA733-P	
017-016	2SK30ATM-GR	FET
017-103	2SK117-GR	FET

DIODE

018-014	1S2473
018-093	M4C31-14 #1 200 v 3 A
018-082	W02 bridge rectifier
018-101	1SR-35-200
018-035	RD5.6EB or 05Z5.6L
019-013	SLP-131B LED red

IC

020-097	μPC4558C

POTENTIOMETER

026-478	EVCT3AP15	20 kB
026-477	EVCT3AP15	10 kB
026-476	EVCT3AP15	1 kB

OTHERS

171-002	Arm unit assy AU-2 including:
077-027A	Arm no.27A
067-031	Guide no.31
069-019	Shaft no.19
065-020	Head cover no.250
064-012	Platform no.12
070-005	Spring no.5 head height adj.
067-025	Tape guide no.25 L
067-005	Tape guide no.5 post
063-008A	Plate no.8A platforms mount
070-032A	Spring no.32A plunger
070-007	Spring no.7 plunger
069-018	Shaft no.18 AU-2 link
112-001	Pinch roller no.1
065-250	Cover no.250 in rear of panel
064-033	Pcb fastener LCBS-4N

For the rest parts of tape drives, see page 4.